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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,733	11/17/2003	Victor L. Klimov	S-102,311	4376

35068 7590 03/16/2007

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EXAMINER	
KUGEL, TIMOTHY J	
ART UNIT	**PAPER NUMBER**
1712	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/715,733	KLIMOV ET AL.	
	Examiner	Art Unit	
	Timothy J. Kugel	1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) *13-16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 17-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-27* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-27 are pending as amended on 14 June 2006. Claims 13-16 are withdrawn from further consideration.

2. The text of those sections of Title 35, US Code not included in this action can be found in a prior Office action.

3. Due to an inadvertent error, claim 19, in the previous Office action, should have been removed from the rejection under 35 USC 102(b) as being anticipated by US Patent Application Publication 2002/011080 (Barney hereinafter) and included in the rejection under 35 USC § 103(a) as being unpatentable over Barney in view of US Patent Application Publication 2002/0155507 (Bruchez hereinafter). The rejections have been corrected below. Applicant is thanked for pointing-out this error.

Election/Restrictions

4. This application contains claims 13-16 drawn to an invention nonelected in the reply filed 30 November 2005. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Information Disclosure Statement

5. In the interest of compact prosecution and as a courtesy to the applicant, the reference Schaller, R. D., et al. Tunable Near-Infrared Optical Gain and Amplified Spontaneous Emission Using PbSe Nanocrystals, J. Phys. Chem. B, 2003, 107, 13765-13768 (Schaller hereinafter) supplied by applicant and referenced in the reply filed 6 February 2007 has been included on the List of References Cited form PTO-892 included with this Office action.

Claim Rejections - 35 USC § 102 and/or 35 USC § 103

6. Claims 1, 2, 4-9, 17, 18, 20-23 and 25 stand rejected under 35 USC 102(b) as being anticipated by Barney.

Barney teaches colloidal nanocrystals, a solid composite including nanocrystals and a process of making a solid composite including nanocrystals comprising mixing nanocrystals—including ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, AlN, AlP, AlAs, AlSb, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, TlN, TlP, TlAs, TlSb, PbS, PbSe and PbTe nanocrystals (¶¶0011 and 0022)—with a amphiphilic material—including alkyl phosphines, alkyl phosphine oxides, alkyl phosphonic acids, or alkyl phosphinic acids such as tri-n-octyl phosphine and tri-n-octyl phosphine oxide (¶0022) or poly(lauryl methacrylate) (¶0015)—and a sol-gel precursor—such as silicon alkoxide, titanium alkoxide or zirconium alkoxide (¶0031)—and forming a solid matrix containing the nanocrystals (¶0031) at ratios of 5:1 to 10:1 of the nanocrystal solution to the binder

(¶0042) such that the resulting composition has upwards of 80% high emission quantum efficiency (¶0018).

7. Claims 11, 12, 26 and 27 stand rejected under 35 USC 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Barney.

Barney teaches colloidal nanocrystals, a solid composite including nanocrystals and a process of making a solid composite including nanocrystals comprising mixing nanocrystals—including ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, AlN, AlP, AlAs, AlSb, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, TlN, TlP, TlAs, TlSb, PbS, PbSe and PbTe nanocrystals—with a amphiphilic material—including alkyl phosphines, alkyl phosphine oxides, alkyl phosphonic acids, or alkyl phosphinic acids such as tri-n-octyl phosphine and tri-n-octyl phosphine oxide or poly(lauryl methacrylate)—and a sol-gel precursor—such as silicon alkoxide, titanium alkoxide or zirconium alkoxide—and forming a solid matrix containing the nanocrystals at ratios of 5:1 to 10:1 of the nanocrystal solution to the binder such that the resulting composition has upwards of 80% high emission quantum efficiency as detailed above.

Since Barney teaches the same composition as claimed, the transparency of the sol-gel host and the uniformity of the distribution of the nanocrystals of the Barney composition would inherently be the same as claimed.

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a

rejection under both 35 USC 102 and 103. "There is nothing inconsistent in concurrent rejections for obviousness under 35 USC 103 and for anticipation under 35 USC 102." *In re Best*, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977).

8. Claims 3, 10, 19 and 24 stand, rejected under 35 USC § 103(a) as being unpatentable over Barney as applied to claims 1, 2, 4-9, 11, 12 and 17-27 above in view of Bruchez.

Barney teaches colloidal nanocrystals, a solid composite including nanocrystals and a process of making a solid composite including nanocrystals comprising mixing nanocrystals—including ZnS, ZnSe, ZnTe, CdS, CdSe, CdTe, HgS, HgSe, HgTe, AlN, AlP, AlAs, AlSb, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, TlN, TlP, TlAs, TlSb, PbS, PbSe and PbTe nanocrystals—with a amphiphilic material—including alkyl phosphines, alkyl phosphine oxides, alkyl phosphonic acids, or alkyl phosphinic acids such as tri-n-octyl phosphine and tri-n-octyl phosphine oxide or poly(lauryl methacrylate)—and a sol-gel precursor—such as silicon alkoxide, titanium alkoxide or zirconium alkoxide—and forming a solid matrix containing the nanocrystals such that the resulting composition has upwards of 80% high emission quantum efficiency as detailed above.

Barney does not disclose expressly the use of octylamine-modified poly(acrylic acid) as an amphiphilic polymer.

Bruchez discloses semi-conductor nanocrystals produced with partially grafted poly(acrylic acid) in which octylamines were attached to about 40% of the carboxyl groups of the poly(acrylic acid) (¶0287).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the octylamine-modified poly(acrylic acid) polymer of Bruchez in the compositions and processes of Barney. The motivation to do so would have been to produce a water-soluble semi-conductor nanocrystal composition (Bruchez ¶0287).

Response to Arguments

9. Applicant's arguments filed 6 February 2007 have been fully considered but they are not persuasive.

Applicant argues that Barney fails to teach "admixing...to form an alcohol-soluble colloidal nanocrystal-polymer complex"; however, since Barney teaches the same nanocrystals complexed with the same polymer, the two must have been admixed and since the same complex is taught it must also be alcohol-soluble.

Applicant further argues that Barney fails to teach a modified poly((meth)acrylic acid) including hydrophobic regions; however, Barney teaches poly(lauryl methacrylate) with is a modified methacrylic acid and contains the lauryl hydrophobic group.

Applicant further argues that Barney fails to teach complexation and only teaches the poly(laurel methacrylate) as a matrix material for conventional nanocrystals such as ZnS capped CdSe crystals; however ZnS and CdSe crystals and the poly(lauryl

methacrylate) meet the components of the instant claims therefore the same complexation must take place.

Applicant finally argues that Schaller shows unexpected results over Barney in view of Bruchez in that the present invention has yielded PbSe films that lase in the infrared; however, Schaller does not reference the claimed subject matter or either Barney or Bruchez and there is no evidence submitted comparing the claimed subject matter to the closest prior art.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Kugel whose telephone number is (571) 272-1460. The examiner can normally be reached 6:00 AM – 4:30 PM Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TJK
Art Unit 1712

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